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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
KRUSE, DAVID H	

ART UNIT	PAPER NUMBER
1638	

NOTIFICATION DATE	DELIVERY MODE
03/13/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No.	Applicant(s)	
	08/992,914	WATANABE ET AL.	
	Examiner	Art Unit	
	David H. Kruse	1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 December 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *6,43 and 46-86* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *6 and 43* is/are allowed.

6)☒ Claim(s) *46-86* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

STATUS OF THE APPLICATION

1. This Office action is in response to the Arguments filed 29 December 2008.

2. The provisional Double Patenting rejection of record is withdrawn in view of the claims allowed in Application 09/301,766.

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 101

4. Claims 46-51 remain rejected under 35 U.S.C. § 101 because the claimed invention is not supported by either a substantial asserted utility or a well-established utility. This rejection is repeated for the reasons of record in the Office action mailed 27 June 2008. Applicants arguments filed 28 December 2008 have been fully considered but are not found to be persuasive.

Applicants' arguments concerning the merits of the examination of U.S. Patent 6,891,084 (Osumi *et al*, the '084 Patent) will not be debated by this Examiner (pages 3-5 of the response).

Applicants argue that the Examiner should be careful about drawing a firm conclusion about the identity of SEQ ID NO: 23 as a RFS. Applicants argue that it is true that a plant transformed with SEQ ID NO: 23 shows a small increase (about 10%) in raffinose content, and this certainly provides a possibility that SEQ ID NO: 23 does encode a RFS. Applicants argue that there is no demonstration that this is actually due to increased RFS activity. Applicants argue that the increase in raffinose content might be due to increased activity of a different enzyme in the raffinose biosynthetic pathway,

e.g. enzymes in the pathway that produce substrate for RFS and thus drive a higher amount of raffinose biosynthesis (page 6, 3rd paragraph of the response). This argument is not found to be persuasive, Applicants provide no evidence that contradicts the asserted activity taught by Osumi *et al*.

Applicants argue that it is the situation that the analysis mistakenly includes embodiments that are not operable that is at issue. Applicants argue that even if SEQ ID NO: 23 of Osumi '084 does in fact encode a RFS, the failure of sequence identity analysis as urged by Appellants to properly identify it as a RFS does not harm the argument that such analysis is sufficient to establish utility of an enzyme, since utility as a RFS would only be ascribed to those enzymes that do show high sequence identity to a RFS (page 6, 4th paragraph of the response). This argument is not found to be persuasive because Applicants have not provided evidence of the substantial asserted utility of instant SEQ ID NO: 3 (the soybean sequence).

Applicants argue that their assertion of utility of enzymes encoded by nucleic acids cloned according to the teachings of the present specification, due to their activity as RFS's is made based on facts known at the time of filing of the application. Applicants argue that the facts relied upon in making the original assertion of utility are either presented in the specification itself, or were known in the art. Such facts include: 1) the cloning of DNA encoding an enzyme established by biochemical experiment to be a RFS; 2) the successful cloning, by use of primers having sequences found in common with another RFS-encoding nucleic acid, of additional nucleic acids encoding proteins having high similarity to the amino acid sequence of a protein shown biochemically to

be a RFS; and 3) the common use in the art at the time the invention was made of sequence identity analysis to create hypotheses about the biochemical nature of proteins (page 7, 1st paragraph of the response). These arguments are not found to be perusaive. Applicants have established the asserted utility for SEQ ID NO: 1 (claims 6 and 43) which is not in question in the instant rejection. The matter at issue is the utility of the nucleic acid sequences in claims 46-51.

Applicants argue that their initial assertion of utility is made based upon facts available at the time of filing of the application. Applicants argue that even if only the three sequences noted by the Examiner as contemporaneous with the filing of the application, those from cucumber from SEQ ID NO: 2 and SEQ ID NO: 4 are used, the Examiner should note that these two sequences are much more closely related to each other than to any stachyose synthase or seed imbibition protein, and so the conclusion that one can tell a RFS from a STS from a SIP based upon a degree of sequence identity remains valid. Applicants argue that this is furthermore consistent with the expectations of one of ordinary skill in the art, since this approach to identifying biochemical function of a newly sequenced protein was common in the art at the time the invention was made as evidenced, e.g. by the use of the same approach by Richmond (2000) (page 7, 2nd paragraph of the response).

Applicants argue that the Examiner's argument is based on the fact that it appears that only one of Appellants' amino acid sequences is actually a raffinose synthase .... " Applicants argue that the "fact" alleged is a conclusion reached by the Examiner, not a fact at all. Applicants argue that the facts are that Appellants prove by biochemical tests

that one amino acid sequence (SEQ ID NO: 2) is a RFS. Applicants argue that additional sequences are asserted to encode RFS enzymes based upon an analysis of sequence data showing that their amino acid sequences match those of known RFSs better than they match the sequence of any other enzyme (paragraph spanning pages 7-8 of the response).

These arguments are not found to be persuasive. Richmond had explicitly stated that "Recent results concerning the relationship between enzyme structure and function, such as experiments showing that as few as four amino acid changes can alter the catalytic outcome of an enzymatic reaction from desaturation to hydroxylation… emphasize the need for caution in using sequence similarity to infer function based on sequence." (paragraph spanning columns on page 497). This issue is of importance for nucleic acids encoding instant SEQ ID NO: 2. Instant claims 48-51 are directed to partial coding sequences and hence have not been shown to have the asserted substantial utility asserted by Applicants. See *Brenner v. Manson*, 383 U.S. 519 (1966), which states "The basic quid pro quo contemplated by the Constitution and the Congress for granting a patent monopoly is the benefit derived by the public from an invention with substantial utility. Unless and until a process is refined and developed to this point--where specific benefit exists in currently available form--there is insufficient justification for permitting an applicant to engross what may prove to be a broad field."

Claim Rejections - 35 USC § 112

5. Claims 52-74, 77 and 82-86 remain rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. This rejection is

repeated for the reasons of record in the Office action mailed 27 June 2008. Applicants arguments filed 28 December 2008 have been fully considered but are not found to be persuasive.

Applicants argue that in *Wallach*, only a single example of the protein encoded by the claimed DNA (or claimed in the parent application) was provided, and no structural information beyond the first few amino acids was disclosed. Applicants argue that in the present application, four instances of isolation of cDNAs of the invention are demonstrated in working examples, and the protein encoded is one about which a great deal is known from the prior art. Applicants argue that as disclosed in the present specification, a number of plants that express a raffinose synthase are set forth, and a set of PCR primers that effectively hybridize to the mRNA of encoding the enzyme and that can be used to isolate the cDNA encoding the message, are set forth. Applicants argue that the disclosure of the present application is sufficiently detailed that distinct sets of primers for use in different genera of plants are provided. Applicants argue that two full-length protein sequences are disclosed in the present application. Applicants argue that the facts of Wallach, and those of the present application, are plainly so very different that Wallach is inapposite to the present appeal (page 8, 3rd paragraph of the response).

Applicants argue that molecular biologists routinely rely upon sequence similarity analysis to assign putative biological activities to unknown proteins. Applicants argue that the specification describes how to test any particular isolated protein, e.g. one

expressed from cloned DNA according to the invention, for biochemical activity of a RFS (page 9, 2nd paragraph of the response).

Applicants argue that the claimed subject matter is described in product-by-process terms, and the Examiner cannot reasonably argue that the process steps recited in the claims are not well-described in the present specification. Applicants argue that efficacy of the described process in obtaining nucleic acids encoding RFS enzymes is unequivocally demonstrated in four working examples from four different species in three genera. Applicants argue that these claims specifically recite that the nucleic acid obtained by the process must encode a functional RFS enzyme. Applicants argue that to the degree that some applications of the describe process might fail in some instances, those instances are excluded from the claims (page 9, 3rd paragraph of the response).

Applicants argue that the legal test for sufficiency of written description support for a claimed invention is whether or not the specification evidences that the inventors had "possession" of the claimed invention. *Vas-Cath v. Marhurkar*, 19 USPQ2d 1111 (Fed. Cir. 1991). Applicants argue that demonstrating that a described process works to obtain its intended result four times must surely evidence possession of that process, and so possession of products of that process as presently claimed (page 9, 4th paragraph of the response).

Applicants argue that the specific sequences recited in the claims are incorporated into the product of the recited process. Applicants argue that those sequences are obtained from portions of the RFS gene the inventors have identified as conserved

across the relevant family, and so likely to be a structure related to the biochemical function of the enzyme. Applicants argue that those sequences serve to distinguish the claimed subject matter from all other nucleic acids (page 10, 1st paragraph of the response).

Applicants argue that these claims are product-by-process claims, and include limitations as to how the product is made. Applicants argue that the case law is quite clear that if a composition can be described in terms of how it is made, it is acceptable to make a claim in which the product is so described. *Fier v. Revel*, 25 USPQ2d 1601 (Fed. Cir. 1993) (page 10, 3rd paragraph of the response).

These arguments are not found to be persuasive. Applicants' arguments had been substantially addressed in the decision by the Board of Patent Appeals and Interferences in related application 09/301,766 (mailed 11 August 2008), Applicants having acknowledged the relatedness in the Appeal Brief on page 4, filed 23 July 2007. In brief, the description of a partial coding sequence does not adequately describe an amino acid sequence having a specific function (*in re Wallach*). In addition, the disclosure of a possible method of isolation of a genus of nucleic acids is not an adequate description of such a genus of nucleic acids. See *University of Rochester v. G.D. Searle & Co.,* 68 USPQ2d 1424, 1433 (DC WNY 2003) which teaches knowing the "starting point" is not enough; that is little more than a research plan.

6. Claims 46-77 and 78-86 remain rejected under 35 U.S.C. § 112, first paragraph, because the specification, while being enabling for an isolated nucleic acid encoding the amino acid sequence of SEQ ID NO: 2, a chimeric nucleic acid comprising said isolated

nucleic acid, a transformant comprising said chimeric nucleic acid, a plasmid comprising said nucleic acid, a host organism either a microorganism or plant comprising said plasmid, and a method of metabolic modification of a plant comprising introducing said isolated nucleic acid, does not reasonably provide enablement for an isolated nucleic acid encoding the amino acid sequence of SEQ ID NO: 4, 6 or 8, or an isolated nucleic acid that hybridizes with a complement to said isolated nucleic acid isolated from any leguminous, laminaceous or monocotyledonous plant. This rejection is repeated for the reasons of record in the Office action mailed 27 June 2008. Applicants arguments filed 28 December 2008 have been fully considered but are not found to be persuasive.

Applicants argue that the Examiner still has failed to address all of the factors that are to be considered under the guidance of *In re Wands*. Applicants argue that as Appellants have argued, the Examiner has failed to make a proper *prima facie* case for lack of enablement, and the instant rejection cannot be sustained (page 11, 2nd paragraph of the response). This argument is not found to be persuasive. MPEP § 2164.04 states that "While the analysis and conclusion of a lack of enablement are based on the factors discussed in MPEP § 2164.01(a) and the evidence as a whole, it is not necessary to discuss each factor in the written enablement rejection."

Applicants argue that as they have previously shown, e.g. by the paper of Richmond (2000), the artisan of ordinary skill is willing to consider evidence from sequence comparison as at least suggestive of biological function. Applicants argue that the required burden of persuasion is the "preponderance of the evidence." Applicants argue that an artisan of ordinary skill would accept that an enzyme that is more similar

in sequence to a RFS than to a STS or SIP is more likely than not to believe that the enzyme is a STS (page 11, 3rd paragraph of the response). This argument is not found to be persuasive for the reasons of record as it relates to the nature of the invention and the breadth of the claims.

The Examiner notes that the instant rejection to the extent it is directed to claims 46-51 relates to the rejection under 35 U.S.C. 101.

Conclusion

7. Claims 6 and 43 are allowed.

8. Claims 46-86 remain rejected.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David H. Kruse, Ph.D. whose telephone number is **(571) 272-0799**. The examiner can normally be reached on Monday to Friday from 8:00 a.m. to 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anne Marie Grunberg can be reached at **(571) 272-0975**. The **central FAX number for official correspondence i**s 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group Receptionist whose telephone number is (571) 272-1600.

/David H Kruse/
Primary Examiner, Art Unit 1638
9 March 2009